VTTL050R15BNB

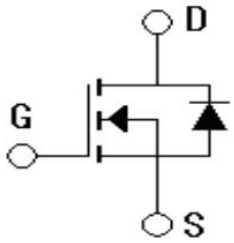
Datasheet

1.55Ω, 500V, N-Channel Power MOSFET VTTL050R15BNB

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
500V	1.55Ω@10V	5A

Symbol



Symbol of VTTL050R15BNB

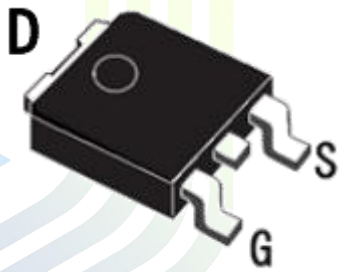
Features

- Low Gate Charge
- Low Crss
- Advanced Planar Process
- Rugged Poly silicon Gate Structure

Application

- BLDC Motor Driver
- UPS
- Electric Welder
- High Efficiency SMPS

Package Type



TO-252

Package Type of VTTL050R15BNB

Ordering Information

Product Name	Package
VTTL050R15BNB	TO-252

Absolute Maximum Ratings (T_J= 25 ºC, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	500	V
Gate-Source Voltage		V_{GSS}	±30	V
Continuous Drain Current	T_C= 25 ºC	I_D	5	A
Pulsed Drain Current@V_{GS}=10V Note1		I_{DM}	15	
Single Pulsed Avalanche Energy		E_{AS}	80	mJ
Total Power Dissipation	T_C= 25 ºC	P_D	45	W
Derating Factor above 25℃			0.36	0.36W/ºC
Junction Temperature		T_J	150	ºC
Storage Temperature		T_{STG}	-55 to 150	ºC
Maximum Lead Temperature for Soldering Purposes		T_L	300	ºC

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$		62.5		ºC/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$		2.8		ºC/W

Electrical Characteristics (T_J= 25 ºC, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D= 250uA	500	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 500V, V_{GS}=0V	-	-	1	uA
		V_{DS}= 400V, V_{GS}=0V T_J= 125 ºC	-	-	100	
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±30V, V_{DS}= 0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	2.5	-	4.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D= 2.5A	-	-	1.55	Ω
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=25V	-	528	-	pF
Output Capacitance	C_{OSS}	V_{GS}=0V	-	52	-	pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz	-	4	-	pF
Switching Parameters						
Total Gate Charge	Q_g	V_{DS}=400V	-	13	-	nC
Gate-Source Charge	Q_{gs}	V_{GS}=0 to 10V	-	3	-	
Gate-Drain Charge	Q_{gd}	I_D= 5A	-	6.2	-	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 250V	-	14	-	ns
Turn-on Rise Time	t_r	V_{GS}=10V	-	15	-	
Turn-off Delay Time	$t_{d(off)}$	I_D= 5A	-	29	-	
Turn-off Fall Time	t_f	R_G=25Ω	-	12	-	
Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_{SD}= 5A	-	-	1.5	V
Pulsed Source Current[Note2]	I_{SD}	Body Diode	-	-	5	A
Diode Forward Voltage[Note2]	I_{SM}		-	-	15	
Reverse recovery time	trr	V_{GS}=0V I_{SD}= 5A di/dt=100A/us	-	213	-	ns

Notes:

1. Pulse width limited by maximum junction
2. Pulse Test：Pulse Width ≤380μs,Duty Cycle≤2%

Typical Performance Characteristics

Figure 1: Transfer Characteristics

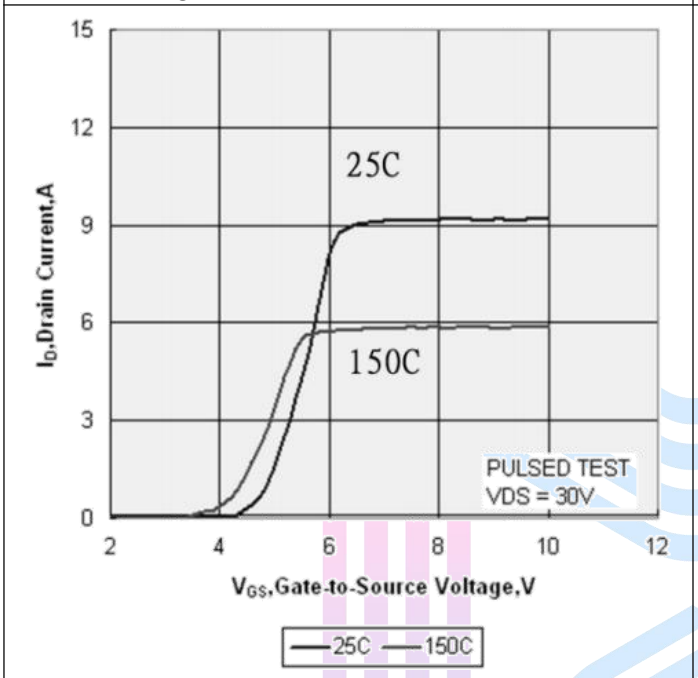


Figure 2: Output Characteristics

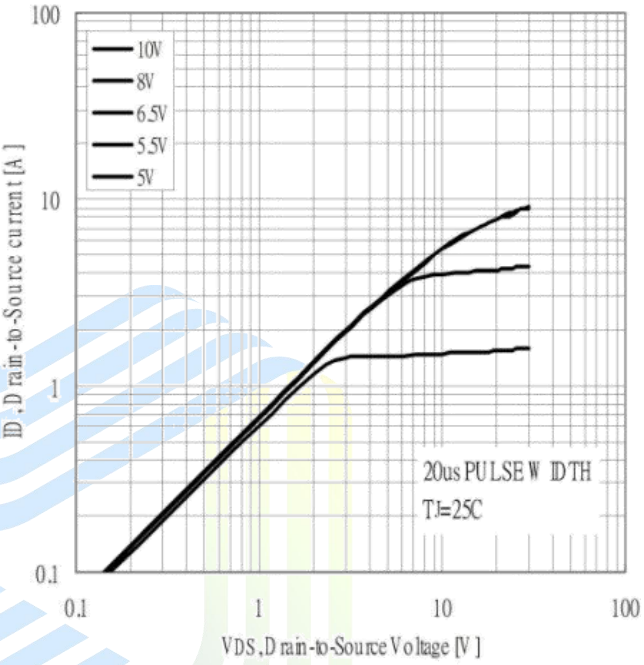


Figure 3: On-Resistance vs. Temperature

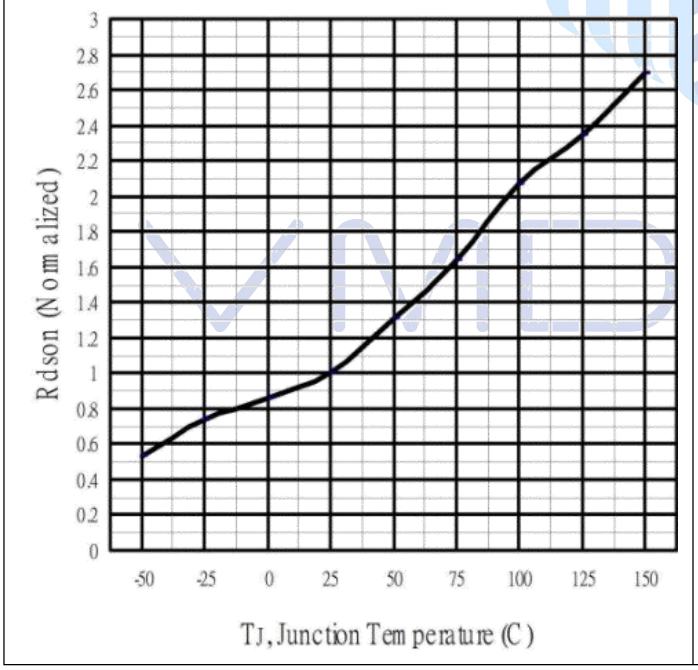


Figure 4: Breakdown Voltage vs. Temperature

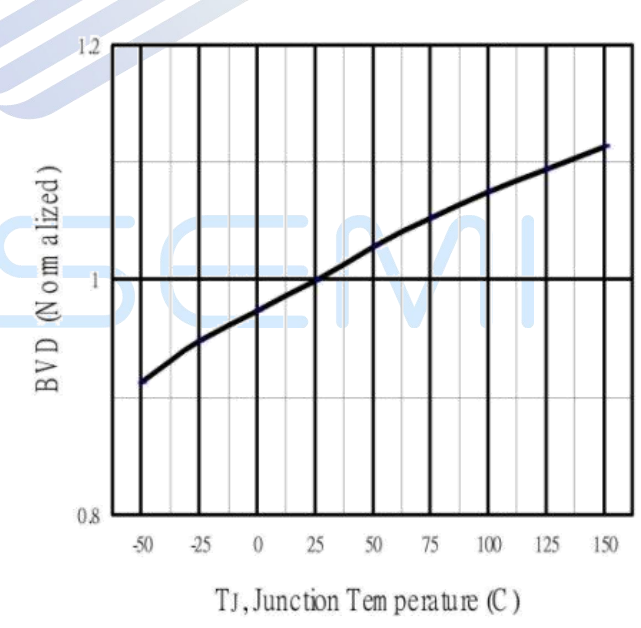


Figure 5: Typical Capacitance

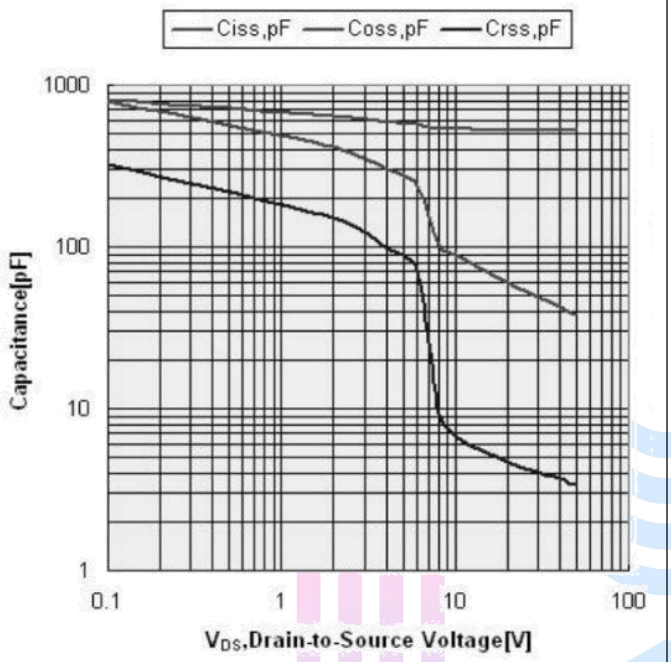
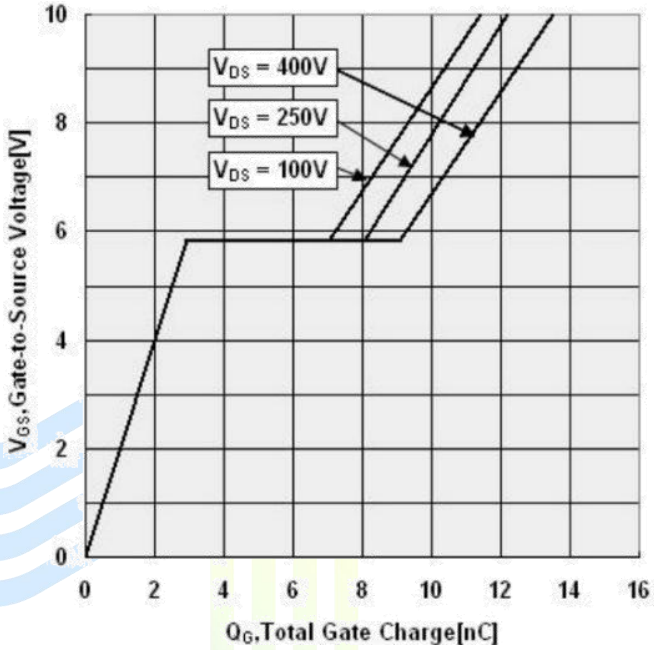


Figure 6: Gate Charge



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